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(54) FORMATION OF
AMORPHOUS SILICON
FILM

(57) Abstract:

PURPOSE: To form an amorphous silicon film at a low temp. and high speed in the stage of forming the amorphous silicon film on a substrate by thermal decomposition of higher gaseous silane by mixing the specific group III compd. with the gaseous raw material.

CONSTITUTION: A substrate 40 consisting of silicon or quartz glass, etc. is put in a decomposition furnace 10 formed of quartz glass and a heater 20 of a halogen lamp, etc. is disposed on the outside of the furnace 10. Higher gaseous silane 60 such as disilane, trisilane, tetrasilane, etc. expressed by the general formula $\text{Si}_n\text{H}_{2n+2}$ ($n \geq 2$ integer) and having 2, 3, 4 (n), carrier gas 70 such as Ar and hydride, halide, org. compd. 80 of the group III compd. such as B, Al, Ga, In, etc. are mixed and the mixture is passed through the inside of the furnace 10. The mixture is at the same time heated to $100^\circ\text{W}/600^\circ\text{C}$ by the heater 20 to decompose thermally the gaseous silane, by which amorphous silicon film is formed on the surface of the substrate 40 at a relatively low temp. and high speed.

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